

## REMARKS

Applicants appreciate the continued detailed examination evidenced by the Final Official Action mailed May 2, 2005 (hereinafter the "Final Official Action"). Applicants also appreciate the allowance of Claims 19 and 20 and the indication that Claims 2, 5, and 7-12 include patentable subject matter and would be allowable if rewritten as indicated in the Final Official Action. *Final Official Action, page 4.*

In the interest of brevity, Applicants' remarks herein focus on the recitations of independent Claim 1 which recites in part:

**removing a portion of a barrier layer outside an intaglio pattern in a mold layer to expose an upper surface of an oxide layer included in the mold layer and avoiding removing a portion of the barrier layer on the intaglio pattern;**

forming a conductive layer on the portion of the barrier layer on the intaglio pattern and on the upper surface; and  
removing the conductive layer from the upper surface.

As described herein below in greater detail, Applicants maintain that Tanahashi does not disclose at least the above highlighted recitations.

### **Independent Claim 1 is patentable over Tanahashi.**

Claims 1, 3, 4, 6, 13, 14, 17, and 18 stand rejected under 35 U.S.C. §102 over U.S. Patent No. 6,064,084 to Tanahashi ("Tanahashi"). *Official Action, page 2.* As understood by Applicants, the Final Official Action considers the conductor layer 84 of Tanahashi to disclose the barrier layer recited in independent Claim 1. *See for example the Final Official Action, page 2.* Applicants maintain that the conductor layer 84 in Tanahashi does not disclose the recited barrier layer as Tanahashi describes the conductor layer 84 as a conductive layer, not a barrier layer. For example, Tanahashi describes the structure associated with the conductor layer 84 as follows:

a conductor layer 84 is deposited on the structure thus formed after removing the resist mask 83.

Next, the structure of FIG. 7B is subjected to a CMP process in the step of FIG. 7C for removing the conductor layer 84 from the top part of the

interlayer insulation film 82 and further for removing the top part of the interlayer insulation film 82 itself. Thereby, a conductive sleeve 84 is formed such that a top rim 84a extends laterally. Thereby, the top rim 84a forms the contact area of the contact structure. As the top rim 84a has an increased area, the contact structure reduces the contact resistance successfully and the reliability of the electrical contact is improved substantially. *Tanahashi, column 14, lines 55-67.*

As understood by Applicants, the above-cited passage of Tanahashi illustrates that the conductor layer 84 is to provide conductive surface for a contact, not a barrier layer as claimed. Accordingly, Applicants respectfully maintain that independent Claim 1 is patentable over Tanahashi for at least the reasons described herein. Furthermore, dependent Claims 3, 4, 6, 13, 14, 15, 17, and 18 are patentable over Tanahashi for at least the reasons described above with respect to independent Claim 1.

**Many of the dependent claims are separately patentable.**

In addition to the reasons described above in reference to independent Claim 1, many of the dependent claims provide separate bases for patentability. For example, dependent Claim 6 recites in part: "wherein the barrier layer comprises at least one material selected from the group consisting of Ti, Ta, TiN, Ti/TiN, TaN, Ta/TaN, and WN." It appears that the Final Official Action considers the bitline pattern 40 shown in FIG. 4O of Tanahashi to disclose the recitations of Claim 6. However, as shown in FIG. 4O of Tanahashi, the bitline pattern 40 is not a diffusion barrier layer. For example, as shown in some exemplary embodiments according to the invention in FIGS. 3-5, the barrier layer is removed from outside the intaglio pattern while avoiding removing of the barrier layer on the intaglio pattern (*i.e.*, in the contact hole 109 to provide barrier layer 111a). Accordingly, dependent Claim 6 is also patentable over Tanahashi for at least these additional reasons.

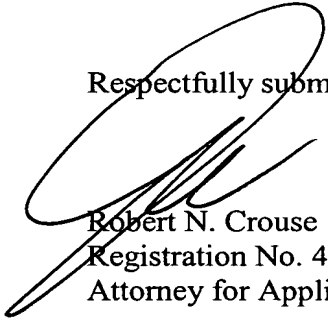
**CONCLUSION**

Applicants have shown herein Tanahashi does not disclose or suggest the recitations of pending claims. Therefore, Applicants respectfully request the withdrawal of all rejections

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and the allowance of all claims in due course. If any informal matters arise, the Examiner is encouraged to contact the undersigned by telephone at (919) 854-1400.

Respectfully submitted,

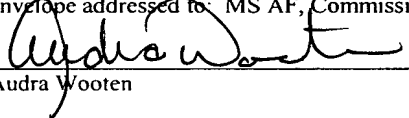


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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MS AF, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450, on July 1, 2005.



Audra Wooten